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October 12, 1957

VOL. 72, NO. 16 PAGES 225-248

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

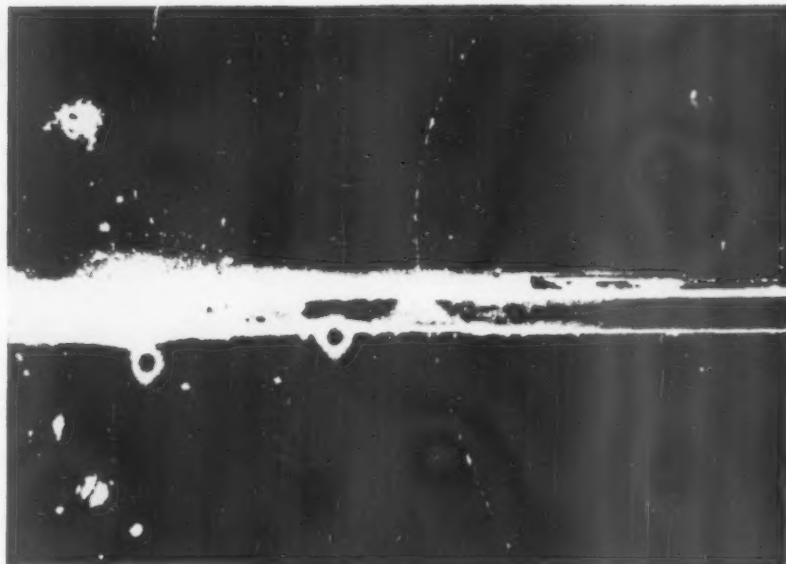


Extinct "Uncle"

See Page 227

A SCIENCE SERVICE PUBLICATION

On
Television,
Friday
Night,
October 25



Featured in the program on cosmic-ray research is this classic scientific photograph of positron tracks taken by Dr. Carl D. Anderson in 1932. Photograph courtesy of *The Physical Review*.

"The Strange Case of the COSMIC RAYS"

"The Strange Case of the Cosmic Rays" is the third program in the Bell Telephone System's new TV Science Series.

The two earlier programs—"Our Mr. Sun" and "Hemo the Magnificent"—were widely acclaimed by educators, scientists and the general public.

Scientific accuracy is assured by a Scientific Advisory Board and distinguished advisors,

including Dr. Carl D. Anderson, Dr. Bruno Rossi and Dr. Marcel Schein. The program was produced and directed by Academy-Award-winning director Frank Capra.

Everyone associated with the sciences will find "The Strange Case of the Cosmic Rays" of unusual interest. Don't miss it—and remind your colleagues to see it on Friday, October 25.

In color and black and white on the **NBC-TV** network, Friday, **October 25, 9-10 P.M., E.D.T.** Please check your local listing for time and station.

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ANTHROPOLOGY

Neanderthal Found in Iraq

A recent Smithsonian Institution expedition provides scientists with important information on what one early man looked like and how he lived.

See Front Cover

► THE CAUSE of a death that occurred some 60,000 years ago is revealed by Dr. Ralph S. Solecki of the Smithsonian Institution, recently returned from the Near East. The victim was a Neanderthal man, extinct "uncle" of modern man.

It was a rockfall in a cave in Iraq, probably caused by an earthquake, that killed the primitive man. His bones, terribly crushed by the falling rock, were found by Dr. Solecki at a depth of 23 feet below the floor of Shanidar Cave in the Zagros Mountains of northern Iraq. (See SNL, July 25, 1953, p. 56.)

Above this skeleton, at a depth of 14.5 feet, lay another skeleton possibly 45,000 years old. Its skull appears in the cover photograph.

Both skeletons were well-preserved by the soil of the cave and were not fossilized. They were identified as Neanderthal men of the type known to anthropologists as "conservative," similar to the type found in La Chapelle-aux-Saints, France.

The upper, or more recent, skeleton was

of a person who must have been about five feet, three inches tall. He was beetle-browed with sloping forehead and protruding teeth. Two of his front teeth had been knocked out during his lifetime. The falling rocks that killed him cut off his feet, all but cut off his head, crushed his chest and bashed in the vault of his skull.

The skull of this Shanidar man, shown on the cover of this week's SCIENCE NEWS LETTER, has one very apparent difference when compared with that of the Neanderthal man found in France. The brow ridge is broken between the eyes instead of being carried across above the eyes in a continuous bulge or "torus."

Although not members of the Homo sapiens race to which modern man belongs, these ancient people used tools and fire. Primitive tools of chipped stone and the remains of hearth fires were found with their bones.

In spite of their antiquity, the skeletons are of particular interest to anthropologists because of their youth, not their age. This is because some 600 miles away at Mount Carmel in Palestine, Neanderthal bones have been found that are much more like

modern man. Yet the Mount Carmel men are believed to antedate Shanidar men.

On the same expedition, Dr. Solecki's party explored a New Stone Age village site that dates from the same time as the long occupancy of Shanidar Cave. The stone foundation remains they uncovered indicate some kind of rude architecture, one of the earliest found in Mesopotamia. The site is older than the village of Jarmo in Kurdistan, excavated by a University of Chicago expedition in 1948.

Members of the Smithsonian expedition led by Dr. Solecki included his wife, Dr. Rose L. Solecki, and Dr. Philip Smith of Peabody Museum, Harvard University; and George Maranjian of Arabian American Oil Co. in Saudi Arabia.

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AERONAUTICS

First Automatic Computer Controls Air Traffic

► AUTOMATIC CONTROL of most airplane flights—commercial, military and private—is scheduled for completion within four years. It will make air trips both safer and speedier.

The first automatic computer, scheduled to be standard equipment for all Civil Aeronautics Administration control centers, is now in operation at Indianapolis, Ind. It regulates air traffic in the fourth busiest center in the country, an area 400 miles long and 250 miles wide in the nation's midsection.

The computing machine does in 20 seconds calculations what would take a man about four minutes. Added to the time saved is the elimination of human errors.

Automation applied to aircraft flights does not mean, however, that control tower operators will be out of jobs. On the contrary, they will be able to concentrate their full attention on safety measures. Now they must spend fully 50% of their time on the routine daily processing that will be taken over by machines.

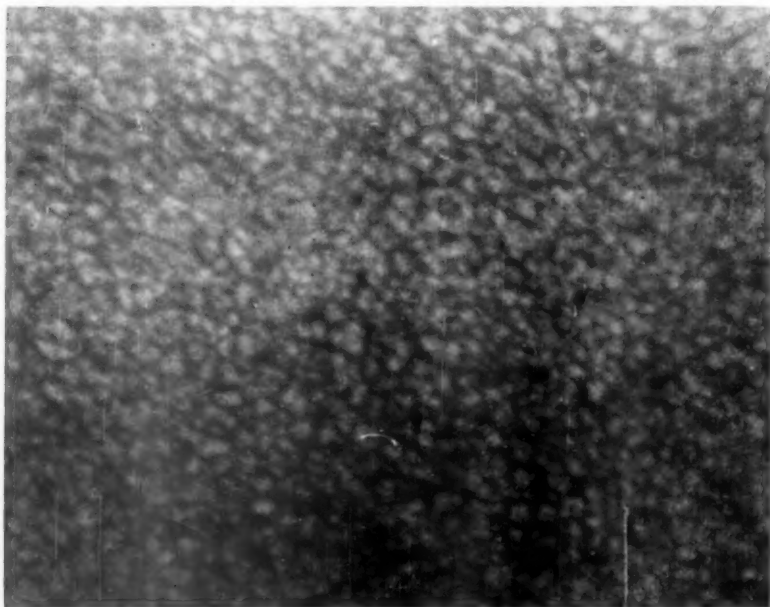
Using computers is only the first step in the CAA's plan to increase the safety and speed of aircraft flights. The system was pioneered by the CAA's Technical Development Center in Indianapolis, which is under the direction of D. M. Stuart.

The next step is to feed information on all flights passing over more than one center directly from one control computer to the next one. This would reduce manual operation from the present 100% to five-sixths percent.

This would be followed by installation of a device known as "Fliden," short for Flight Data Entry Device, which allows the direct input into the computer of flight data reported by a pilot to an outlying station.

Scheduled next is the addition of an automatic display and a controller's input device. Equipment to do both of these jobs is now being tested at the Technical Development Center. When incorporated into the planned flight control system, all but 17% of the present manual steps will be done automatically.

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TURBULENT SUN — This sun photograph taken at 81,000 feet by the stratoscope solar telescope camera shows the variation in brightness of the eddies on the sun's surface. These eddies are caused by turbulent motion and differ in temperature by many hundreds of degrees. The hotter eddies are brighter, the cooler ones are darker. The photograph was taken at $f/200$, at a speed of one-thousandth of a second. (See SNL, Oct. 5, p. 213.) White streaks and black spots are imperfections in the negative.

GENERAL SCIENCE

Scientists for NATO

► INTERNATIONAL science scholarships, summer study institutes, and annual mathematics and science competitions with awards for teachers and students in secondary schools throughout NATO countries will be proposed at the Nov. 11 NATO meeting of the Conference of Members of Parliament.

Long-range plans include establishment of a NATO university that would draw its faculty and students from the finest minds in Europe and America.

A special NATO Committee on Scientific and Technical Manpower was set up at the Conference meeting in Paris last November. Senator Henry M. Jackson (D-Wash.) was chairman of the meeting.

Sen. Jackson formed an American Advisory Group, inviting some of the country's outstanding educators, scientists and business men to assist in preparing recommendations for consideration of the Committee.

The Committee includes, among others, Dr. Detlev W. Bronk, president, National Academy of Sciences; Dr. J. R. Killian, president, Massachusetts Institute of Technology; Dr. Edward Teller of the University of California's Radiation Laboratory; Brig. Gen. David Sarnoff, chairman of the board,

Radio Corporation of America; Eric Johnston, president, Motion Picture Association, and Dr. John A. Wheeler, Princeton University physics professor, chairman of the Advisory Group.

Two hundred more Ph.D.'s each year in critical fields would be the goal of the proposed NATO scholarship program. Greater numbers of summer study institutes, both in the United States and Europe, sponsored by universities and industry, are also recommended in Senator Jackson's report.

To stimulate greater interest and effort in mathematics and science, the suggested international competitions would award prizes on the basis of examinations. Winning students and their teachers would share the prizes, with the larger portion of the awards money going to the teacher.

These immediate steps would be at least temporarily financed by NATO funds, with private industry contributing instructors and experience to the international educational program.

Basic purpose of the plan is to provide maximum opportunity for developing scientific ability.

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GENERAL SCIENCE

Federal Work Rates High

► A CAREER in Government for scientists is one of the "most challenging and potentially rewarding," Dr. Allen V. Astin, director of the National Bureau of Standards, told the American Physical Society meeting in Boulder, Colo.

He said his 25 years of Federal service "had more general social value and somewhat more scientific value" than might have been possible outside the Government. The people who emphasize cases where scientists have suffered on the Federal payroll are doing the Government a disservice, Dr. Astin charged.

He said this "knowing full well the implications of this statement in relation to my own personal history." Dr. Astin was referring to his dismissal, and subsequent reinstatement, as director of the National Bureau of Standards because the agency's findings concerning a commercial battery additive did not conform with the "play of the market place." (see SNL, July 4, 1953, p. 6)

The kind of satisfaction he has found in his job, Dr. Astin said, is "repayment for much of the so-called disadvantages."

On the subject of scientists and public responsibility, he made these points:

1. Scientists are ordinary human beings with essentially the same virtues and deficiencies that most people have in varying degrees. As citizens they have substantially the same responsibilities as other citizens.

2. In direct contacts with the public, scientists should interpret as clearly, accurately and simply as possible the nature of

their work, and its technical implications and limitations.

3. The greatest contribution that scientists, either individually or collectively, can make to the public good is to do their professional work well.

4. Scientists with special reasons for assuming public responsibility should enter Government service, since there are important and unique opportunities there, either as full-time career employees, or as temporary experts and advisers.

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MANPOWER

Ask Recruiting Code For Students, Industry

► THE U. S. CHAMBER of Commerce and the College Placement Council, Inc., have taken steps to protect the American college student against "high-pressure job recruiting tactics."

The student protection plan is designed to be voluntarily accepted by all students, colleges and employers, including the Federal Government. Issued in the form of broad proposals, the plan is outlined in a publication entitled, "Principles and Practices of College Recruiting," recently released.

The plan has two general aims, to protect the student against himself and to protect him against developing the wrong idea about business.

Without a recruiting guide, the Chamber reports, students run the risk of not making

a wise choice of a career, of not questioning the high standard of integrity of employers, of cutting short their plans for further education and failing to develop an attitude of personal responsibility.

The principles and practices designed to save the student from these pitfalls are based on studies by business groups, Federal agencies, college placement officials and officers of private and state universities.

They call for competent college counseling services, factual information concerning employers, the scrapping of special bonuses and other financial incentives and the acceptance of an employment offer by a student to be made in good faith and with sincere intention of taking the job.

Science News Letter, October 12, 1957

SCIENCE NEWS LETTER

VOL. 72 OCTOBER 12, 1957 NO. 15

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N.W., Washington 6, D. C., North 7-2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283) authorized February 28, 1950. Established in mimeograph form March 13, 1922. Title registered as Research Council, U. S. and Canadian Patent Offices. Indexed in Reader's Guide to Periodical Literature, Abridged Guide, and the Engineering Index.



SCIENCE SERVICE

Member Audit Bureau of Circulation. Advertising Manager: Fred A. Moulton, 1719 N. St., N.W., Washington 6, D. C., ME. 8-2562.

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MEDICINE

Antibiotics Still Effective

The problem of whether or not antibiotics are causing the development of resistant strains of bacteria is being argued pro and con by scientists and medical doctors.

► SCIENTISTS who claim bacteria are becoming more resistant to antibiotics will have to prove it, Drs. Burton A. Waisbren and Carl Stelitzer, Milwaukee County General Hospital, Milwaukee, Wis., told the Fifth Annual Antibiotics Symposium meeting in Washington.

They reported on a five-year study of ten different antibiotics used in 500 patients with staphylococci infections. The results showed that the bacteria have not become more resistant to the drugs.

Staphylococci are the pus-forming bacteria that cause carbuncles and wound infections and may lead to serious blood infections. They are of particular concern to hospitals.

In 1953, 60 pounds of the antibiotics were used in the Milwaukee hospital and in 1956 the amount had increased to 116 pounds. Yet the resistance of the bacteria did not vary significantly in either year, the scientists reported.

"The burden of proof still rests with those who postulate that antibiotic usage has had a profound effect on the world of bacteria," they added.

Two factors which may change the resistance, however, are geographical location and weather conditions. The rapid change in the present Asian influenza virus came

about without a known influence by man; possibly the same thing is happening to staphylococci in regard to their penicillin resistance.

Hospitals are having more trouble with staphylococci infections because their patients are more susceptible to infections. This is believed to be due both to their ages and to the illnesses which modern medicine is prolonging.

Bad Penicillin Reactions

► SERIOUS REACTIONS to the wonder drug penicillin are increasing every year, Dr. Henry Welch, U. S. Food and Drug Administration, told the antibiotics symposium.

A nation-wide survey, the first of its kind, has been carried out since 1953 to study reactions to the principal antibiotics and penicillin has been shown to be the most dangerous.

Over 3,000 case histories of severe reactions were collected from hospitals and private physicians. One-third of them were classified as life-threatening and the other two-thirds as not life-threatening.

Most of the life-threatening ones followed

the use of penicillin and included severe shock, infections and skin reactions.

The number of penicillin reactions is still small considering that millions of persons receive the drug and it has saved tens of thousands of lives, Dr. Welch pointed out.

But the increasing number of serious ones, especially from intramuscular injection of the drug, shows there should be a clear-cut need for it before it is given, he added.

The survey also showed the so-called broad spectrum antibiotics are relatively safe from bad reactions. These drugs, which include the antibiotics Aureomycin and Terramycin, are effective against many different types of bacteria.

Other scientists reported on the immediate use of the enzyme penicillinase to stop bad penicillin reactions.

Penicillinase inactivates the penicillin that is still in the body by breaking it down chemically.

The drug should be on hand in every doctor's office and hospital to help prevent fatal shock, Dr. R. M. Becker, Madison, Wis., told the symposium.

If it were given within 24 to 48 hours after the reaction started, there would probably not be the 200 to 300 deaths from penicillin predicted for this year, he said.

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GENERAL SCIENCE

Japanese Teachers See Science Fair Exhibits

► SCIENCE TEACHERS in Japan found that the general level of science education in American high schools is higher than they thought it would be.

The teachers, along with the public, got an idea of the American high school student's scientific abilities by viewing seven projects brought to Japan from the United States.

The American exhibits had originally been shown at the Eighth National Science Fair in Los Angeles. (See SNL, May 25, p. 326.) They were selected by a Japanese delegation at the American event for showing throughout Japan.

Looking over a fossil collection made by a Kansas high school boy, a prominent Japanese geology professor was heard to comment, it is "better than most of our university students can classify."

The seven lively exhibits were shown in Tokyo in Yomiuri Hall of the Yomiuri Shimbun newspapers which are sponsoring a science fair and awarding science prizes. The Japanese science effort has been modeled after that administered by SCIENCE SERVICE in the United States, which has cooperated with the Japanese in starting their program. (See p. 233.)

Dr. Motoichi Tada, who was a guest at the Eighth National Science Fair, described what he had seen at Los Angeles to those who visited the exhibit hall.

After the Japanese Science Awards are announced on Nov. 3, the seven American exhibits, together with about 100 Japanese exhibits, will be shown again at the Mitsukoshi department store in Tokyo and then shown in Osaka, Nagoya and Hokkaido.

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AMERICAN SCIENCE IN JAPAN—Japanese students and teachers, together with the public, view one of the exhibits selected from the Eighth National Science Fair.

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MINERALOGY

Lignite Found in India

India has gained an important source of power, necessary for its technological and economic advance, with the discovery of a large lignite field in the south.

➤ **EARTH-MOVING** operations have begun to uncover one of the world's large fields of lignite, the soft brown substance intermediate between peat and coal.

The lignite fields at Neyveli, India, stretch over 100 square miles, in a thick layer about 180 feet below the ground level, reports T. M. S. Mani, managing director of the Neyveli Lignite Corporation (Private) Ltd. Geologists have estimated that 2,000 million tons lie buried with more easily workable deposits of 200 million tons occurring in an area of about five and one-half square miles.

(Upon this smaller area in the South Arcot district, 135 miles south of Madras, India's Prime Minister Jawaharlal Nehru on May 20, 1957, inaugurated the work as part of India's advancement "from a static economy to a dynamic, moving and self-motivated economy.")

First use of the lignite will be in a thermal plant to generate 200,000 kilowatts of power yearly for relief of the power-short areas of South India. This source of electricity will release valuable reservoir water for irrigating crops during the dry months of the year.

A proposed 380,000 tons of carbonized briquettes manufactured yearly from the lignite will substitute for coal now transported over long distances from the north. The smokeless briquettes will also be welcomed by village housewives for cooking their rice and curry, in place of valuable cow dung which could be turned back to enrich the fields.

A third important use of lignite will be in a fertilizer factory to produce urea.

The danger of floods from many high pressure artesian springs, a unique freak of nature that has prevented relatively easy conventional mining of the lignite, is a major problem of the project.

Below the 55-foot thick layer of lignite, the water exerts an upward thrust of about six to eight tons per square foot. Once the weight of the thick burden of tough sandstone and earth is removed from the top of the lignite, this pressure is lifted, and water would heave upwards, bursting through the lignite seam to flood the mine.

Thus pressure must be kept continuously under control. A careful system of mechanized open cast mining has been worked out, with elaborate systems of large-scale pumping. Forty-eight thousand gallons of water per minute will have to be pumped out from 48 wells to maintain the pressure surface of the springs at safe level below the lignite.

Only a relatively small section of lignite will be exposed and cut out at a time, a section about 6,000 feet long and 1,200 feet wide at the top. While huge earthmoving

machines dig step-like terraces towards the lignite, other machines will cover up the areas already dug, thus releasing earth pressure from only a small area at a time.

Mining engineers estimate about 3.5 million tons of lignite will be removed in this way each year—the equivalent of about a million and a quarter tons of good coal. The lignite seam of the first cut is expected to be exposed in 1960, with full production reached the end of that year or in 1961.

Lignite is formed from vegetable matter in a manner similar yet midway between that forming peat and coal.

Millions of years ago plants flourished and then gradually decayed into the material known today as peat. In some places, floods and movements of the earth's crust deposited soil and other matter on top of this decaying peat and stopped the bacterial action. Thus peat was consolidated and dehydrated into what we now call lignite. In other parts of the world soil pressure was further increased, and lignite was compressed further into coal.

Production of lignite throughout the world fluctuates widely from year to year. Statistics show that Germany is the largest producer of lignite. Large quantities are also produced in Russia, Czechoslovakia and Hungary.

The Government of India has given a high priority to the Neyveli project because of the acute shortage of fuel and power in South India. With this operation, which has received American and other nations' technical and economic aid, India hopes to speed up the development of industry and agriculture in the southern areas.

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TECHNOLOGY

Two Materials Damaged Slightly by Radiation

➤ **TWO MATERIALS** only slightly damaged by exposure to neutron and gamma radiation have been found by scientists of the General Electric Company, Evandale, Ohio.

The materials are an alumina-silica body in felt form and an essentially pure silicon dioxide in batt form. They were tested for possible radiation damage both in reactors and cyclotrons, W. R. Morgan and W. G. Baxter reported to the American Society of Mechanical Engineers meeting in Hartford, Conn.

Their use as an insulating material for nuclear reactors is being investigated further, the scientists said, but tests to date show a satisfactorily low level of nuclear "poisoning," even at high level exposures to neutrons and gamma radiation.

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PUBLIC HEALTH

USSR Studies Radiation

Evidence that radiation doses could affect man's resistance to bacterial infections, even promoting the spread of one disease, whooping cough, is presented by Soviet research.

► SOVIET MEDICAL researchers are delving into the dangers that can result from an atomic war or excessive exposure to radiation.

They have found the amount of radiation sickness suffered by man determines his resistance to bacterial infections such as tetanus and gas gangrene. They have also found a fairly high dosage of radiation from X-rays can prolong whooping cough and even help its spread in the lungs.

The Soviet radiation research findings are reported in a second volume of *Abstracts of Soviet Medicine* published by the Excerpta Medica Foundation of Amsterdam, The Netherlands.

In one study, by Drs. P. N. Kiselev and E. V. Karpova of the Central Roentgen-Radiological Institute, Leningrad, 2,000 white mice were subjected to doses of 300, 500 and 700 roentgens. (For humans, it is estimated that 400 to 450 roentgens would kill 50% of those exposed and 600 or more roentgens would kill nearly all persons within 30 days. It takes 530 roentgens to kill 50% of a mouse population.)

These mice were then given toxins of *Bacillus tetanus* and *B. perfringens* or gas

gangrene the next day and each week thereafter. The Russian scientific team found the sensitivity of mice towards the toxins depends on the severity of the radiation sickness produced. The sensitivity 24 hours after exposure to 300 roentgens, for example, is one and one-third times greater than that of animals not exposed to radiation.

This shows, the Russians report, that exposure to radiation results in a weakening of the natural ability to fight bacterial infection and is important for the treatment of bacterial infections in cases of radiation sickness.

In a second study with mice, Dr. B. N. Sofronov of the department of microbiology of the Institute of Experimental Medicine, Leningrad, found that whooping cough can be prolonged in the lungs of mice with a dosage of 400 roentgens from X-rays. In addition, he found, the irradiation helps to spread the infection.

The whooping cough-radiation study also revealed exposure to radiation immediately before or after the mice were immunized against the disease inhibited the production of antibodies and lessened the effect of the serum.

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PHYSICS

High-Speed Photos for Study of Bubbles, Drops

► HIGH-SPEED photography is showing that the size and shape of bubbles and drops become important in the liquid-liquid or gas-liquid contacts that are so necessary in making such products as gasoline, rayon, asphalt, dynamite, DDT and even maraschino cherries.

Dr. Robert C. Kintner, professor of chemical engineering at the Illinois Institute of Technology in Chicago, has been using high-speed photography to study bubbles and drops. He is interested in their shapes and speeds in relation to size, the effect the surrounding fluid has on them and the role surface-active agents and impurities play in their size, shape and internal structure.

A large variety of shapes has been discovered in gas bubbles.

Besides spherical ones, there are flattened spheres, ellipsoidal bubbles, "cap-shaped" spheres and even "inverted tear-drop" shaped bubbles, formed in special liquids. Liquid drops of tear shape have been found to leave behind a fine "vapor trail" of tiny droplets of mist.

Dr. Kintner observed that surface-active agents much like laundry detergents hinder circulation within the drops or bubbles, slow them up in their travel and prevent them from merging into larger bubbles or drops.

Impurities in the surrounding fluid tend to concentrate in the interface between close-packed drops or bubbles, and act as "shields" to prevent them from merging, behaving like the surface-active agents. Almost any impurity can act this way.

Certain phenomena shown by bubbles and drops can only be discovered by using high-speed photography, said Dr. Kintner. The observations will be used to construct mathematical equations that can "predict" the way the drops or bubbles will act, thus helping to increase the efficiency of processes which have to make use of bubble and drop phenomena.

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INVENTION

Patent Office Hopes To Bar Advertising

► THE U. S. PATENT Office has initiated action to prohibit patent attorneys and other agents from soliciting patent business through advertising.

A proposal to amend the current regulations, made by Robert C. Watson, Commissioner of Patents, and approved by the Acting Secretary of Commerce, Walter Williams, appears in the *Patent Gazette* (Sept. 24).

The proposed amendment to the rules of practice in patent cases calls for the refusal of recognition to practice before the Patent Office and even suspension, exclusion or disbarment for those guilty of advertising.

The change in the regulations is aimed at preventing "the use of advertising, circulars, letters, cards, and similar material to solicit patent business, directly or indirectly. . . ."

It makes exception, however, for the use of "simple" professional letterheads, calling cards or office signs, simple announcements for opening an office or changing an address, and insertion of listings in the classified section of a telephone book. Displays in the classified section, on the other hand, would be forbidden.

The Commissioner has called for views, arguments or suggestions about the proposed changes and has also set Nov. 19, 1957, for a hearing on the matter.

At present, advertising for business is considered unethical by the American Bar Association, other bar associations and the American Patent Law Association. The large majority of patent attorneys and agents comply with these codes of ethics. Of the 6,000 persons registered to practice before the Patent Office, not all of whom are lawyers, it is estimated that about one percent are presently advertising for patent business.

The proposed changes are directed primarily against this small group.

A similar change was made by the Patent Office in 1950 in the Trade Mark rules.

Other Government agencies and departments have similar bans for those persons practicing before them against advertising for business, including the Department of Interior, Post Office Department, Veterans Administration, Immigration and Naturalization Service and the Interstate Commerce Commission.

Science News Letter, October 12, 1957



BUBBLE PICTURES — Electronic flash photography is used to obtain instantaneous shapes and sizes of bubbles moving in a liquid field. Dr. Robert C. Kintner checks the work of graduate student Shaukat Azim. The camera used in the experiments rests on the platform which appears in the student's direct line of vision. The tall cylinder contains the liquid being studied.

PHYSIOLOGY

Blood "Sludge" May Cause Deafness

► "SLUDGE" in the blood may be responsible for some cases of deafness, Dr. Edmund Prince Fowler, a New York ear specialist, reports in the *Archives of Otolaryngology* (Oct.), an American Medical Association publication.

The sludge was revealed after examination of the eye's blood vessels, and consisted of clumps of red blood cells. These circulate in the blood during illnesses, after severe injuries, in old age and after emotional upsets.

The sludging was found in various types of sudden and progressive deafness, including Meniere's disease, a condition characterized by head noises and dizziness, and otosclerosis, a degenerative disease of the ear.

When blood cells aggregate in clumps, a shortage of oxygen develops in the area because the blood vessels become clogged and restrict the normal flow of blood. If the oxygen remains cut off too long, damage to the surrounding cells may result, and this may be what happens in ear disorders, Dr. Fowler said.

Emotions and sludging appeared to be related, he added, since most patients with otosclerosis who also showed the sludging had histories of unresolved frustrations and abuses.

During attacks of head noises or dizziness, sludging of the blood regularly occurs. It is also found after the sudden onset of deafness and strongly suggests that sudden deafness is caused by oxygen shortage in the ear's labyrinth due to blocking of the circulation.

Science News Letter, October 12, 1957

GEOPHYSICS

Find Extensive Crack In the Ocean Floor

► DISCOVERY of an extensive crack in the floor of the Gulf of Alaska was announced by Rear Adm. H. Arnold Karo, director of the Coast and Geodetic Survey, U. S. Department of Commerce.

Survey ships operating in Alaskan waters during the present season confirmed the existence of this extensive scar in an area particularly significant as potential spawning grounds of devastating seismic sea waves that rush southward over the Pacific with the speed of a jet aircraft.

The information was pieced together by hydrographers at the Survey's Washington office from the data obtained by the survey ships as they criss-crossed the Gulf of Alaska to and from the working grounds in the Bering Sea and Aleutian Islands.

The existence of the scar, or trough as it is referred to in submarine terminology, has been suspected for many years from the scattered depths that have been recorded in the area. The depths were recorded by electronic echo-sounders, which actually draw a profile of the ocean floor.

Until additional data were received from this season's work, the lines had been too

far apart to recognize the separate depressions as part of one continuous trough.

The trough, which is thought to be possibly a fault or weakness in the ocean floor, is located in the Gulf of Alaska and lies parallel to the Aleutian Trench at a distance of 60 miles to the east.

The slightly curving depression is known to be at least 250, and possibly 400, miles long. The bottom of the trough lies 500 to 700 feet below the sea floor which varies in depth between 9,000 and 13,000 feet.

It is estimated to be about two to three miles wide throughout most of its length. There are indications that the trough continues in a southwesterly direction before joining the deeper Aleutian Trench.

Science News Letter, October 12, 1957

MEDICINE

New Antibiotic Stops Brain-Killing Fungus

► A NEW ANTIBIOTIC that can stop a fatal brain-killing fungus disease was reported by public health scientists to the Fifth Annual Antibiotics Symposium meeting in Washington, D. C.

The antibiotic, called amphotericin, is still under investigation and not yet available for general use.

It was used against cryptococcal meningitis, a highly fatal fungus disease that can attack any part of the body although it has a special attraction for the brain and its covering membranes.

The disease is caused by a fungus found in all parts of this country. It gets inside the body, creating abscesses that can resemble either cancer or tuberculosis.

Six victims of the disease were given intravenous injections of amphotericin B and five are still alive after follow-up studies ranging from five to ten months.

In three of them, all the symptoms of the disease have disappeared and they have resumed normal activities.

Another research team headed by Dr. John P. Utz, National Institutes of Health, Bethesda, Md., has used the experimental antibiotic against fungus diseases that have failed to respond to other antibiotics.

Amphotericin is the first antibiotic that has been effective in any way against histoplasmosis, Dr. Utz told SCIENCE SERVICE.

It was also used against coccidioidomycosis, blastomycosis and moniliasis infections. The antibiotic can be given either by mouth or by injection.

The antibiotic is derived from a species of streptomyces fungus that was found along the Orinoco river in Brazil and brought back for investigation.

So far it has proved relatively non-toxic to humans, Dr. Utz said.

Public health scientists reporting on its use against cryptococcal meningitis were Drs. Harry Rubin, Patrick H. Lehan, Martin J. Fitz Patrick, and Michael L. Furcolow, Communicable Disease Center, Kansas City Field Station.

Associated with Dr. Utz in his study were Drs. Donald B. Louria, Ned Feder, Chester W. Emmons and Norman B. McCullough.

Science News Letter, October 12, 1957

IN SCIENCE

PHYSICS

Confirm Parity Law Not Applicable to Beta Decay

► EXPERIMENTS confirming that a basic idea of physics, the law of conservation of parity, does not hold true in the radioactive decay of neutrons have been conducted by University of Chicago and Argonne National Laboratory. (See SNL, Jan. 26, p. 51.)

If parity were conserved, the electrically charged electrons and protons resulting from a neutron's break-up would be emitted equally toward either pole of the axis around which the neutron is turning.

Instead, the recent experiments showed only about 62% as many electrons came off toward one pole as toward the other. The studies, supervised by Prof. Valentine L. Telegdi of the University of Chicago, will be reported in a forthcoming issue of the *Physical Review*, journal of the American Physical Society.

Science News Letter, October 12, 1957

ENGINEERING

Powerful Test Reactor Open for Inspection

► THE ATOMIC Energy Commission has unveiled its engineering test reactor at the National Reactor Testing Station in Idaho Falls, Idaho.

The reactor, known as ETR, provides the highest neutron flux, the number of nuclear fissions occurring per second, of any known reactor. It averages 1.9 million billion neutrons per square centimeter per second.

The \$14,000,000 reactor, described as the "world's most powerful instrument for the development of nuclear power," is considered a "major breakthrough" in the nation's program to advance construction of nuclear power plants for civilian and industrial use, and to convert aircraft and ships to nuclear propulsion.

In addition to a neutron flux twice that of any other reactor in the world, the ETR is the only test reactor with significant experimental space available within its enriched uranium core where scientists and engineers can determine the effects of intense neutron and gamma ray bombardment on materials.

Dr. W. Kenneth Davis, director of AEC's reactor development, has predicted that more than 50 new test reactors such as the ETR will be necessary to support the installation of more than 2,200 nuclear power plants in the U. S. through 1980.

The reactor went "critical," or began its controlled chain reaction on Sept. 19, 1957. It is expected to play a key role as a research tool in the development of economic nuclear power.

Science News Letter, October 12, 1957

IE FIELDS

BIOLOGY

Chimpanzees Learn to Avoid Lay-Off in Work

▶ A TEMPORARY lay-off, or a short period during which they are not rewarded for the work of pressing a key, is regarded as a punishment by chimpanzees, Dr. C. B. Ferster of the Yerkes Laboratory of Primate Biology, Orange Park, Fla., in *Science* (Sept. 13).

The animals learn to avoid the lay-off just as they would learn to avoid an electric or other form of punishment.

This is the way Dr. Ferster conducted his experiment:

First the chimpanzees learned to press a telephone key which occasionally produced a reward of food. An overhead light was periodically turned off and at the same time the food magazine was disconnected from the key. The animals soon learned it was no use to press the key when the overhead light was out.

Then a red lamp was installed next to the key. The red light was turned on every 15 minutes for 160 to 180 seconds, depending on the animal's behavior. If the chimp pressed the key during the last 20 seconds of the light, the red light went out and then followed the break in which there was no overhead light and no reward for the work of key pressing. If the animal refrained from touching the key during the last 20 seconds of the red light, there was no break.

In most cases, the chimpanzees pressed the key during the early part of the period during which the red light burned at the same rate that they had learned would produce a food reward. But they stopped working abruptly some time before the final 20 seconds, when touching the key would bring on a break.

For humans, as for chimpanzees, the withholding of expected rewards can serve as a real punishment, Dr. Ferster concludes.

Science News Letter, October 12, 1957

BIOLOGY

Use Brain Chemical That Reduces Need for Sleep

▶ A BRAIN-STIMULATING chemical, nicknamed DMAE, that can replace hours of sleep as well as help cure mental patients is reported by scientists from Emory University, the University of California and the University of Texas in *Science* (Sept. 27).

DMAE's full name is 2-dimethylaminoethanol and it is believed to be the chemical from which the body makes acetylcholine, an essential substance found in the brain and nervous system.

Without acetylcholine, nerve impulses could not cross over the many nerve gaps that lie between the brain and the rest of the body.

DMAE may occur in natural foods and regulate the body's production of needed acetylcholine, the scientists report.

Small doses of it create a mild and pleasant degree of nerve stimulation that lessens daytime fatigue and allows a person to sleep sounder and for less time at night.

It was also tried in schizophrenic mental patients at higher dosages and caused increased muscular activity as well as making them talk more than usual.

About 50 patients have been on the drug for about a year and have shown no harmful side effects.

In patients other than schizophrenics, DMAE relieves periodic headaches, functional bowel distress and chronic fatigue, the authors reported.

The scientists included Drs. Carl C. Pfeiffer, Elizabeth H. Jenney, William Gallagher, Richard P. Smith and William Bevan, Jr., Emory University, Ga., Drs. Keith F. Killam and Eva King Killam, University of California, Los Angeles, and Dr. William Blackmore, University of Texas, Dallas.

Science News Letter, October 12, 1957

MEDICINE

"Balloon" X-ray Method Helps Heart Cases

▶ MORE HEART attack victims may be restored to health by a new "balloon" technique demonstrated to scientists at the American Roentgen Ray Society meeting in Washington, D. C.

The X-ray method is used to locate blood clots that are plugging up the coronary arteries. Heart surgeons can thus see exactly where they are and remove them.

Perfect by Drs. Charles T. Dotter and Louis M. Frische, University of Oregon Medical School, Portland, the method, called occlusion aortography, makes it possible to fill the coronary arteries with a dye that appears white in an X-ray picture.

A small rubber tube with a balloon built into its tip is pushed into the heart through a vein and then sent on up into the aorta, the main artery leaving the heart.

The balloon is quickly inflated, stopping the blood flow in the artery momentarily while the dye is injected downward toward the heart. The dye immediately floods the coronary arteries that begin at the base of the aorta and the X-ray is taken.

Other methods to get dye in the coronary arteries have been tried, but none have been too successful.

If the dye is injected directly into the heart or blood stream, it is diluted too fast and not enough of it reaches the coronary arteries to make them visible.

Another problem with older techniques is that the dye itself is harmful in too great a quantity. Enormous quantities of the dye have to be injected into the heart in order to get enough of it in the coronary arteries for a clear X-ray of them. With the new method, less dye is needed. Also dyes of less strength can be used.

Tests of the balloon technique have begun on humans and so far the results have been highly promising.

Science News Letter, October 12, 1957

PHYSIOLOGY

Cancer Cell Test May Be Wrong After Childbirth

▶ CELL CHANGES that produce suspicious smears in cervical cancer tests may be quite common after pregnancy.

Doctors should not jump to the immediate conclusion that they signal the start of cancer, three scientists reported to the joint meeting of the American Society of Clinical Pathologists and the College of American Pathologists in New Orleans.

In the majority of cases, these cell changes result from such temporary conditions as infection and injury from the birth process itself. They are not cancer, and the conditions clear up in time.

Breast feeding may also be an important cause of the suspicious smears because it suppresses ovarian hormones, causing the outer layer of the cervix to thin out. This creates an outpouring of large quantities of cervical cells and magnifies what is only a healing process into a suspected case of cancer.

Women showing suspicious smears should be adequately followed, but any surgery should be delayed until the local irritating factors of pregnancy can be removed, the doctors advised.

In a group of 125 new mothers, they found an unusually high number of suspicious smears, 15 cases. Not one case developed into cervical malignancy later on.

The study was done by Drs. Raymond H. Kaufman, Nathan H. Topek and Jack P. Abbott, of Methodist Hospital and Baylor University College of Medicine, Houston, Texas.

Science News Letter, October 12, 1957

GENERAL SCIENCE

Philippines Aids Science Talent, Understanding

▶ THE DEVELOPMENT of science talent among Filipino youth and the promotion of understanding of science on the part of the public is being organized in Manila by the National Science Board, part of the Office of the President of the Philippines.

Dr. M. V. Arguelles, executive director of the National Science Board, has informed SCIENCE SERVICE that this new program, implemented by a recent law, will draw upon the experience in the United States in organizing science clubs and promoting science consciousness among the public.

A consultant who can advise and inaugurate the science club movement in the Philippines will be invited to come to that country. SCIENCE SERVICE has been asked to recommend candidates from the United States. A young man 30 to 40 years old with scientific and educational experience and interest in the growth of the Philippine people will be preferred.

The Philippines sent two delegates to the National Science Fair at Los Angeles last May to study this method of inspiring and recognizing science ability and interest among youth. (See p. 229.)

Science News Letter, October 12, 1957

GENERAL SCIENCE

Projects Are Important Fun

During high school years science projects often develop into surprisingly mature research work and lead to successful college and career experience.

By SHIRLEY MOORE

► THE MOST exciting word in education today is "project."

By the hundreds of thousands, boys and girls in our schools are doing science projects—experiments and demonstrations that teach by the fun of doing.

But projects were not invented by educators as a teaching technique. They grew, as naturally as Topsy, out of the things children do for the sheer fun of it.

Unless and until they are talked out of it by more orderly adults, children are born collectors of bits and oddities. They spend blissful hours seeing how the world's objects from a bird's nest to the kitchen timer are put together, what they can be made to do, and why or why not. Unhindered by "accepted" ideas, they look at life with brand new curiosity and the simple honesty of the small boy in the story of "The Emperor's New Clothes."

Left to his own inclinations, much of a child's time is spent happily experimenting with private projects. He is born with many of the most important characteristics of the adult scientific mind, although the people around him may not think of it just that way!

Adults Encourage Projects

Parents and teachers are learning to encourage such characteristics, cheerfully putting up with a certain amount of clutter and revising old-fashioned ideas of how clean a child must be kept. If "George" and "Susan" want to spend hours lying on their stomachs watching ants on busy errands or getting acquainted with a couple of earthworms, their mothers are very likely to put them in blue jeans and jerseys, and let them alone.

When he is 18, George may win the interest and praise of other students and science fair judges with his ingenious and thorough exhibit of the interior of an ant hill.

A real George, George Markin of Helena, Mont., did just that. He won first awards in his school and regional fairs and a third place in the National Science Fair. Now he looks forward to a career as a naturalist or an archaeologist.

It may occur to Susan, when she is a junior in high school, that earthworms might carry a built-in antibiotic in their digestive systems, which protects them against bacteria in ingested soil.

Susan Lynn Hopkins of Waterloo, Iowa, had such a notion and developed it into a project that earned her first awards in local fairs and the National Fair. Susan was in-

cluded to continue her research on the extracted antibiotic at the College of Medicine of Iowa State University in summer, 1956. The next fall, an expert on antibiotics, Dr. F. Bustanza of Madrid, Spain, asked for details of Susan's work. This past summer she worked as a biochemist in the laboratories of the Eli Lilly and Company on purification procedures for new antibiotics. She entered college as a pre-med student this fall.

Projects for Every Child

Science project activities have proved to be one of the most appealing and strikingly successful means of catching the interest of large numbers of children and teenagers, and of giving such interest "room to grow in." As the idea has caught on, projects have been adapted to all age levels until students, from the smallest kindergarten novice to the most talented high school senior, are engrossed in searching

out their own answers, and constructing projects or writing reports to demonstrate their discoveries. Many are done as class work and are dramatic, enjoyable means of learning.

For example, there are reports such as the one about some Chattanooga youngsters who studied nutrition by watching the progress of two white rats. One thrived contentedly on balanced meals; the other did not do very well on a diet of sweets, in spite of a nocturnal escapade during which he snacked on the teacher's geranium, some orange peels and a rubber stopper.

Plants and animals come alive for city classrooms when the children grow tree seedlings, cacti, and a colorful variety of flowers, and affectionately raise hamsters, chickens, fish, turtles, praying mantids, snakes, and baby alligators.

Meet Josephine Groundhog, for instance, from Red Bank, Tenn. Her ability as a weather prophet turned out to be extremely poor, but she spent so much time in class that the teacher is reported to have said that Josephine had almost earned a science credit.

Imaginative teachers relate this pleasurable kind of nature study to somewhat less popular subjects such as spelling, arithmetic and geography.

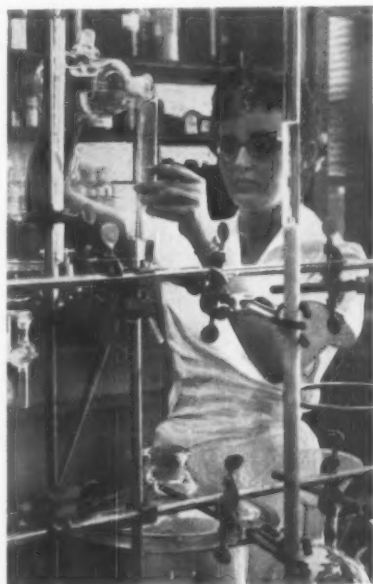
The Wonder of Experiments

When the materials are handy, youngsters delight in making gadgets and experimenting with assorted motors and switches, bells and push buttons, mirrors and prisms.

At the School of Education of the University of Chicago, Dr. Carleton J. Lynde filled a stock room with such inexpensive equipment and let students buy it at cost to take home and "fool around with." The stock room was open to all ages from kindergarten through college, but records kept of the eager buyers show that the peak of interest was among the nine-year-olds.

Dr. Lynde comments, "When these young scientists are thrilled by an experiment, they do it over and over to enjoy again the wonder of it. Then they show it to family and friends and teacher thereby 'leavening the lump.'"

Many projects put together out of ingeniously used odds-and-ends are exhibited eventually at school science fairs. Other projects are done originally because they are required by the teacher or give the student extra credit in a physics, chemistry, or biology course. Still others are created specifically for the fairs that are held all over the country each spring. Whatever their source, the total number of projects proudly exhibited in science fairs each year is now almost astronomical. A fair may be a simple classroom open house or it may include many schools and exhibit 800 projects to 27,000 interested visitors. There are school fairs, regional and state fairs, and the National Science Fair conducted every



PROJECT PROGRESS—This promising and pretty young scientist is 18-year-old Susan Lynn Hopkins of Waterloo, Iowa, a summertime employee of Eli Lilly and Company. She is shown working on a step in the purification of an antibiotic, the direct result of a first-award-winning science project at a National Science Fair.

year by Science Service's Science Clubs of America for the finalists of nearly 150 affiliated regional fairs.

Projects' Scope Broadens

The scope of the projects has done some growing, too. The once-upon-a-time exhibit of several butterfly specimens casually mounted in a box top has given way to expert demonstrations and astonishingly mature research work.

The younger generation keeps up with the latest developments, and many a professional scientist has been amazed to see the newest design in artificial kidneys or ultrasonic interferometers or rockets very competently exhibited at a science fair. These are not just models, copied from drawings. They involve real understanding of the principles and often include new features designed by the young exhibitor. If it is a winning project, some work had been done with the equipment after it was built.

At the most recent National Science Fair, held in Los Angeles last May, high school students showed judges and visitors a new fuel additive, a spray method of autogenous skin grafting, an original design for a liquid fuel rocket which eliminates pressurized fuel tanks, a new type of photographic wide-angled lens, and a study of electroluminescence demonstrating that the excitation voltage varies with the doping material and is proportional to the distance between the electrodes. These are just some samples of the 231 exhibits.

A few of the more complicated projects have grown so large that some fairs now discourage exhibitors of extremely heavy apparatus from competing for the honor of being sent to the National Science Fair as representatives of the regional fair. The cost of transporting such massive equipment sometimes exceeds the entire expense of sending the finalist!

Four-Ton Project

A few years ago, for instance, a 17-year-old finalist's betatron project weighed four tons and had to be sent to the National Fair in a 35-foot moving van. Its young builder had spent four years putting it together and it included, besides the betatron itself, 7,000 pounds of lead shield, 10,000 pieces of steel, 130 capacitors, 14 switches, and an unknown number of miles of wire. (In operation, the device was reported to sound like "a herd of bull moose in distress.") After the fair was over, the exhibitor presented his project to a university where it is now in use.

Regardless of size or simplicity, the experience of doing an independent project and of the contacts with other science-minded students and mature scientists often starts a chain reaction of enthusiasm.

Many youngsters learn, to their own surprise, what ability they have in science. Suddenly they want very much to study science and mathematics courses, looking forward to college training in one of the sciences or in science and math teaching. Others, the already eager science-aspirants,

are more convinced than ever that they have chosen an exciting and rewarding career.

The United States Office of Education reports that this year, for the first time in nearly half a century, the percentage of high school students taking mathematics and science has increased. There are probably many reasons for this increase, but successful personal experience with physics, chemistry, or mathematics would come high on the list, in the opinion of most researchers, of what makes a scientist.

Of the 444 finalists in the Seventh and Eighth National Science Fairs, well over 90% of the boys and girls looked forward to careers in research science, medicine, engineering, science teaching, technical laboratory work or related fields. What is more, studies have shown that up to 88% of the students who reach the level of the national fair actually do go into such careers.

Apparently encouraging the younger generation to do what comes naturally is an inspired way to fill in some of the gaps in our scientific manpower!

Science News Letter, October 12, 1957

RADIO

Saturday, Oct. 19, 1957, 1:30-1:45 p.m., EDT
"Adventure in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.

Dr. James A. Reyniers, research professor of bacteriology, University of Notre Dame, Notre Dame, Ind., will discuss "Germ-Free Life."

PUBLIC HEALTH

Stomach Not Hurt by Swallowing Plutonium

► SWALLOWING large amounts of radioactive plutonium will not hurt the stomach or intestines, Drs. Maurice F. Sullivan and Roy C. Thompson, General Electric Company, Richland, Wash., report in *Nature* (Sept. 28).

Their finding disagrees with the earlier idea that these organs are sensitive targets for radioisotopes, especially those that give off alpha particles.

They tested the effects of plutonium-239, an alpha-emitting isotope, on a group of laboratory rats. Very large doses of the isotope could be eaten before any symptoms of intestinal radiation damage appeared.

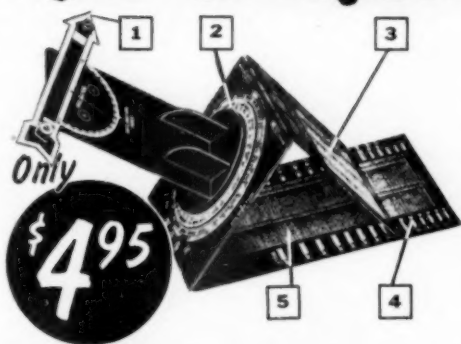
For all practical purposes, the dangers from such isotopes in the stomach and intestines can be ignored when calculating the maximum permissible radiation exposure.

Alpha particles probably cause no damage because they travel only short distances and the radiation-sensitive cells of the intestinal wall are too far away to be affected by them. Also, the particles have such low energy that a single sheet of paper can stop them.

With beta-particle emitters the situation is different. Tests with yttrium-91 showed that this isotope, when ingested, caused as much damage as heavy X-ray exposure.

Science News Letter, October 12, 1957

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INTRODUCING THE CONSTELLATIONS

by ROBERT H. BAKER

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Other Books on Astronomy

WHEN THE STARS COME OUT

by ROBERT H. BAKER

Illustrated with photographs and maps. \$3.50

MEN OF OTHER PLANETS

by KENNETH HEUER

Illustrated by R. T. Crane. \$3.00

THE STARS BY CLOCK AND FIST

by HENRY M. NEELY

Illustrated with maps, star lists, time charts, and diagrams. \$4.00

THE VIKING PRESS

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 14 Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ALL ABOUT STRANGE BEASTS OF THE PRESENT—Robert S. Lemmon—*Random House*, 148 p., illus. with drawings by Rudolf Freund, \$1.95. Telling children about strange-looking creatures with amazing ways.

ALL ABOUT THE ARCTIC AND ANTARCTIC—Armstrong Sperry—*Random House*, 146 p., illus. with drawings by the author, \$1.95. A book about the most distant places of the world for children of all ages.

BIOLOGICAL APPLICATIONS OF INFRARED SPECTROSCOPY—Robert P. Bauman, Consulting Ed.—*New York Academy of Sciences, Annals*, Volume 69, Art. 1, 253 p., illus., paper, \$3.50. There has been a dramatic growth of infrared spectroscopy over the last decade. The editor predicts that within a year or so the infrared spectra of solids may be useful in probing the mysteries of crystal lattices.

THE BOOK OF SHRUBS—William Carey Grimm—*Stackpole*, 522 p., illus. with drawings by the author, \$5.00, boxed with *The Book of Trees*, \$9.50. Describing and illustrating almost 150 shrubs, native and naturalized, of the Northern United States.

THE BOOK OF TREES—William Carey Grimm—*Stackpole*, 363 p., illus. with drawings by the author, \$5.00, boxed with *The Book of Shrubs*, \$9.50. A popular manual on the trees of the Northern United States.

BUILDING BLOCKS OF THE UNIVERSE—Isaac Asimov—*Abelard-Schuman*, 256 p., illus., \$3.00. Interestingly written book for young people about the chemical elements.

CELL PHYSIOLOGY—Arthur C. Giese—*Saunders*, 534 p., illus., \$10.00. Controversies on less important points are minimized so that the major achievements in cellular physiology are not obscured.

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CITIES IN THE SAND: Leptis Magna and Sabratha in Roman Africa—Kenneth D. Matthews, Jr.—*University of Pennsylvania Press*, 160 p., illus. with photographs by Alfred W. Cook, \$10.00. A pictorial introduction to two towns that 2,000 years ago were thriving agricultural and commercial centers of great importance to Rome.

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COMMISSION ON INCREASED INDUSTRIAL USE OF AGRICULTURAL PRODUCTS REPORT TO THE CONGRESS—J. Leroy Welsh, Chairman—*Senate Committee on Agriculture and Forestry*, 135 p., paper, free upon request direct to publisher, Capitol, Washington 25, D. C. Reporting the search for new uses for familiar farm products as well as for potential uses for the thousands of wild plants about which nothing is yet known.

DETERMINATION OF SR⁹⁰ AND BA¹⁰⁰ IN BONE, DAIRY PRODUCTS, VEGETATION, AND SOIL—H. L. Volchok, J. L. Kulp, W. R. Eckelmann and J. E. Gaetjen—*New York Academy of Sciences, Annals*, Volume 71, Art. 2, 9 p., paper, 75 cents. Discussing a technique for determining the fission product contamination in many natural materials.

ECONOMIC BACKWARDNESS AND ECONOMIC GROWTH: Studies in the Theory of Economic Development—Harvey Leibenstein—*Wiley*, 295 p., graphs, \$6.75. The author's aim is explanation, not prescription.

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REPORTS ON THE PRODUCTIVE USES OF NUCLEAR ENERGY: Summary of Findings—Policy Suggestions for the Future—NPA Special Policy Committee—*National Planning Association*, 59 p., paper, \$1.50.

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STRENGTHENING SCIENCE EDUCATION FOR YOUTH AND INDUSTRY: Proceedings of the Seventh Thomas Alva Edison Foundation Institute, Nov. 19-20, 1956—*New York University Press*, 162 p., paper, \$4.00. Contributors from various fields presented these papers aimed at remedying the shortage of scientific manpower.

THE STUDENT-PHYSICIAN: Introductory Studies in the Sociology of Medical Education—Robert K. Merton, George G. Reader and Patricia L. Kendall, Eds.—*Harvard University Press*, 360 p., graphs, \$5.00. A medical education, it is revealed, is more than consuming an enormous amount of medical knowledge, it is also training in how to deal with uncertainties.

Science News Letter, October 12, 1957

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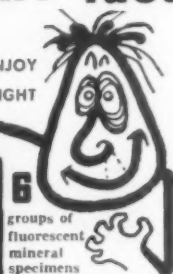
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ROENTGENOLOGY

Brain Defects Shown By X-Rays of Pelvis

➤ SUSPECTED CASES of mongoloidism in infants can be confirmed by X-rays of the pelvis, even before the infant has grown enough to show any outward signs of the defect.

This was reported by Dr. John Caffey, Columbia Presbyterian Medical Center, New York, to the American Roentgen Ray Society meeting in Washington.

The entire mongoloid pelvis is smaller than the normal pelvis and the difference between the two is most noticeable in infancy.

Mongoloidism is a severe form of mental deficiency for which there is no cure. It gets its name from the fact that mongoloids have flattened skulls and slanted eyes, somewhat resembling those of the Mongolian people.

The X-ray is important so that children with a similar appearing condition at birth, but who are not mongoloid, can be helped back to normal health with remedial treatment.

Dr. Caffey has made careful measurements from X-ray pictures and set up "normal" and "mongoloid" dimensions as a guide to doctors who are faced with the problem of deciding whether or not an infant is mongoloid.

Science News Letter, October 12, 1957

PUBLIC HEALTH

Cold Vaccine Still in Future

➤ THE MAN in the street is still a long way from being protected from a stopped-up head and runny nose by a cold vaccine, despite reports from Baltimore on the production of a vaccine against one type of cold.

The big problem in "cold" research is deciding what actually is a cold and what is something else. Added to that is the fact that the "common cold," a term from which some scientists shy, can be caused by a great many different viruses hard to identify as the single cause of the illness.

Public Health scientists at the National Institutes of Health hope to bring doctors around to labeling such illnesses "colds" only when there is no fever going along with them.

Vaccines have already been developed and used successfully in the military against respiratory infections caused by the adenoviruses, Dr. Robert J. Huebner, National Institutes of Health, said.

These infections are generally accompanied by fevers, however, and as yet there is no vaccine known to be effective against whatever viruses cause colds without fevers.

There are at least 18 different types of adenovirus, only three of which are incorporated in the vaccine used by the military. These three are considered to be the most important for the Armed Forces. When and if such vaccines are found to be valuable for civilian uses, other types would have to be included, Dr. Huebner said.

Science News Letter, October 12, 1957

Questions

ANTHROPOLOGY—Why are scientists particularly interested in the two skeletons of primitive man found in Iraq? p. 227.

□ □ □

MEDICINE—What is the value of administering penicillinase to patients who have received penicillin? p. 229.

□ □ □

PUBLIC HEALTH—What kind of isotopes do not appear to cause radiation damage when swallowed? p. 235.

□ □ □

ROENTGENOLOGY—How can scientists discover if there is a possibility that an infant may be mongoloid? p. 238.

□ □ □

Photographs: Cover, Smithsonian Institution, p. 227, U. S. Navy, p. 229, Yomiuri Shimbun, p. 231, Illinois Institute of Technology, p. 234, Eli Lilly & Co., p. 240, E. I. DuPont de Nemours.

CHEMISTRY

Gamma Rays Slow Oleo Manufacture

► **GAMMA RADIATION** slows down rather than speeds up the vital process of hydrogenation used in the manufacture of oleomargarine and vegetable shortening from cottonseed oil.

This is the finding of Profs. Lyle F. Albright and Alexander Sesonks, and graduate student Lawrence J. Harrison, of the School of Chemical Engineering, Purdue University, reported to the American Oil Chemists Society meeting in Cincinnati, Ohio.

Using Purdue's 900-curie cobalt-60 source, they hydrogenated cottonseed oil in several runs with radiation and several without. The hydrogenation occurred at slower rates under irradiation.

Previous research on similar processes with other oils, acids and plastics showing gamma radiation speeds up some polymerization reactions has led chemists to expect the same finding with any number of reactions.

Apparently, the gamma rays degrade some of the cottonseed oil into substances that poison the nickel catalyst necessary to the process, according to Prof. Albright. These substances probably include free fatty acids and possibly carbonyls.

Science News Letter, October 12, 1957

Do You Know?

Large doses of *vitamin A* can result in toxic symptoms.

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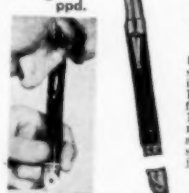
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Science News Letter, October 12, 1957

✿ **EXTENSION HANDLE** for outboard motors provides throttling and steering control from a forward position in the boat. Made of aluminum, the tubular extension telescopes to any length from 28 to 38 inches. It is designed to fit most outboards from five hp and up made since 1954.

Science News Letter, October 12, 1957

✿ **HAND TRUCK** made of magnesium is lightweight enough to be operated by a secretary if need be. The truck has a ratchet-operated tightening device to hold objects. The spring-loaded belt rewinds automatically out of the way when not in use. The truck also has crawler treads for climbing stairs.

Science News Letter, October 12, 1957

✿ **MECHANICAL BLOTTER** soaks up excess moisture from golf courses and other recreational areas. The machine, shown in the photograph, is self-propelled and has a 24-inch-long cellulose sponge roller that ab-



sorb moisture as it rolls across wet grass. The sponge is squeezed by a wringer and the water sent to a removable sump pan.

Science News Letter, October 12, 1957

✿ **PORTABLE SANDER** provides professionals and home handymen with both straight-line and orbital sanding action. The double-action electric sander has a direc-

tional key for its two-way action. Sandpaper or steel wool can be used with the sander.

Science News Letter, October 12, 1957

✿ **COAT HANGER** has built-in de-moth units in each end of the hanger. Molded of plastic, the anti-moth devices hold moth crystals that can be readily replaced or refilled. Available in bronze, ivory, or pinto, a mixture of bronze and ivory, the hanger also has a wide non-slip pants bar.

Science News Letter, October 12, 1957

✿ **UTILITY GLOVES** for both at work and around-the-house feature color and a non-slip grip for added safety. The gloves are available in various styles and in several colors designed to be used as job codings. The fabric is described as being imbedded with thousands of plastic dots.

Science News Letter, October 12, 1957

✿ **RADIO CONTROLLED GARAGE DOOR** operator is described as impossible to trigger by accident and requires no FCC license. The device automatically unlocks, opens, lights, closes and locks any overhead garage door at the push of a button in the owner's car. A combination radio carrier wave and signal impulse modulator works the mechanism.

Science News Letter, October 12, 1957



Nature Ramblings



By HORACE LOFTIN

Debunking Jack Frost



► A BUSY character named Jack Frost is generally credited with the change of forest color from bright green to the brighter golds, browns and reds of this season of the year. However, the work of scientists makes it appear that Jack Frost's job has been over-rated as a cause of change in leaf coloration.

On the basis of completed research, apparently it is the shortening length of daylight rather than the lowering of temperature that leads to the forest's repainting in autumn. As a matter of fact, early frosts can make drab the autumn dress by injuring or killing leaves before the colors reach their heights of brilliance.

In general terms this is what happens: in late summer or early fall, shortening length of day seems to result in a decrease in production of the plant hormone, auxin. This results in the formation of a layer of small cells, the absciss layer, at the base of each leaf. These cells act to cut off the

leaves from the branches, so that little food, water or other materials can be transferred back and forth. Each leaf becomes isolated.

The production of the green pigment, chlorophyll, now halts in the leaves while the old chlorophyll wastes away.

When this green covering is gone, it reveals two yellow pigments—carotene and xanthophylls—which have been masked under the summer green. These account for much of the yellow color, such as is seen in the sycamore leaf in fall.

The brightest hues, red and purple reds, also result from the isolation of the leaves by the absciss layer. These colors are due to a group of red, blue and purple pigments called anthocyanins. Anthocyanins are produced from plant sugars. When a leaf cannot pass the sugars it manufactures through the absciss layer, these sugars accumulate, furnishing abundant raw material for the creation of the colorful anthocyanins.

Red maple, many oaks, dogwood and black gum are examples of trees whose autumn leaves are highly colored by anthocyanins.

Eventually, the isolated leaves become starved and parched, since the chlorophyll necessary for food has been destroyed and water cannot be brought in to the leaves from the main plant.

Soon the cells of the absciss layer become separated from one another, weakening the support of the leaves. Wintry blasts of wind then rip off the leaves, and the forest is bare till spring.

Science News Letter, October 12, 1957